

Homework 2 – Templates

C++ //

Description

For this assignment we will use templates to implement a special type of array. Consider an array with the first index being any positive integer (greater than 0). We can use C++ templates to solve this problem.

Specifications

You will need to complete the following:

1. Define an array class that allows the user to set a lower bound for index values that is different from zero.
2. For example, you can have three template parameters and instantiate an object using the code below:
array<double, 1518, 1538> list;
3. The code above instantiates an array object that holds values of type double, with a starting index of 1518, and a last index of 1538. Therefore, the array above holds 21 values.
4. Override the subscript operator for your array class.
5. Throw exceptions where appropriate, for example, passing an array index that is outside of the bounds set.
6. Consider the code below to test your class: (Make sure you also test invalid indices).

```
array<int, 157, 199> list;  
  
list[157] = 10;  
  
cout << "Value is " << list[157] << "\n";
```

7. Create a loop to fill your array with random values.
8. Create two more loops to display the values of the array forwards and backwards on the console.
9. Again, make sure you show your code will not accept invalid indices.

Documentation

You will create a document (.docx, .rtf, .pdf) which contains the following:

- Your name and assignment.
- A screenshot of your code output.
- Explain in detail the purpose of C++ Templates and the problem they solve. What are the benefits of using Templates?

What to Submit

You need to submit your C++ code files along with your document. Make sure your document is in the correct format and all your files include your name and assignment. **ZIP** your C++ code, but **DO NOT** zip your document file.